

A GUIDE TO MISSOURI'S **SALAMANDERS**



MISSOURI DEPARTMENT OF CONSERVATION®

A Guide to Missouri's Salamanders

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Front Cover: Adult male spotted salamander in upland forest. Photo by Jeffrey T. Briggler

Back Cover: Adult Western Slimy Salamander. Photo by Jeffrey T. Briggler



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GET TO KNOW MISSOURI'S SALAMANDERS

Salamanders consist of about 665 species found on every continent except Antarctica and Australia. North and South America have more salamander species than the rest of the continents combined. They are most diverse in North America with many salamander species restricted to the moist, forested regions of the United States, especially the Appalachian Mountains and Interior Highlands of eastern and central United States. Most salamander species in Missouri are found in the Ozark Highlands and bottomland forests of eastern and southern Missouri. Salamanders are ectothermic, which means they depend on external sources to regulate body temperatures. They cannot generate their own body heat like birds and mammals. Surprisingly many salamanders are active at low temperatures. Missouri is home to 19 species of salamanders and three additional subspecies.



NOPPADOL PAOTHONG

A spotted salamander eating an earthworm.



Most salamanders, such as the eastern long-tailed salamander, have a general appearance similar to lizards, but amphibians differ in many body features, reproduction strategies, and habitat requirements.

Most of Missouri salamanders are long, slender amphibians with moist skin, a long tail, and four legs. Their skin secretions are toxic or irritating to the mucus membranes of our eyes; thorough washing is recommended after handling them. They are most closely related to toads and frogs, but have a general appearance similar to lizards, which are reptiles. Unlike lizards, salamanders have no scales, claws on toes, or external ear openings. Salamanders rely on internal organs, known as otoliths, in their heads to detect sound waves. Also, salamanders live in freshwater or damp environments, lay gelatinous eggs, and are secretive compared to lizards, which prefer warmer, dryer environments, lay leathery-shelled

Most salamander species in Missouri are found in the Ozark Highlands and bottomland forests of eastern and southern Missouri.

eggs, and are readily observed basking in the sun. Most Missouri salamanders have four well-developed legs with toes. Two exceptions to this are Missouri's longest salamander, the three-toed amphiuma, which has very small fore and hind limbs, and the western lesser siren, which only has forelimbs.

Missouri's adult salamanders and their larvae are carnivores—meaning they feed on other animals. They primarily eat a wide variety of aquatic and terrestrial invertebrates, such as ants, beetles, centipedes, crickets, flies, mosquitos, snails, spiders, and worms. Larger, aquatic salamanders, such as hellbenders and mudpuppies, will also prey upon crayfish, small fish, and other amphibians. The terrestrial eastern tiger salamander will prey upon any animal small enough for it to swallow, ranging from small invertebrates to young mice, other amphibians, and occasionally small snakes.

Some of the most common predators of adult salamanders and their larvae are snakes (e.g., watersnakes, gartersnakes, and mudsnakes), mammals (e.g., raccoons, shrews, and skunks), birds (e.g., herons,



BILL ROWE

A great blue heron eating a western lesser siren.



Small-mouthed salamander egg masses with developing embryos.

egrets, and owls), predaceous aquatic invertebrates (e.g., diving beetles, giant water bugs, and dragonfly nymphs), and many species of fish.

Life history requirements for salamander species in Missouri are diverse. A few species are aquatic for their entire life, others depend on water for part of their life, especially breeding, and others only require moist habitats. Reproductive strategies vary widely. The more ancient species, such as hellbenders, have external fertilization, with males spraying sperm onto eggs laid by females. Most species of salamanders have internal fertilization with females picking up a sperm packet, provided by males, within her cloaca and depositing eggs through the sperm for fertilization. Many of these species rely on aquatic habitats (e.g., permanent or temporary wetlands, streams) to deposit their eggs and allow the hatching larvae to forage and grow in this aquatic environment (e.g., mole salamanders and brook salamanders). The larvae will eventually become small salamanders, with many

spending most of their lives on land. Other species only depend on moist environments for reproduction. *Plethodon* species deposit eggs in moist areas, such as rotting logs, cave walls, and other subterranean environments. The embryos develop directly within the egg membranes and hatch into tiny replicates of the adult.



JEFFREY T. BRIGGLER

Late larval stage of the marbled salamander.

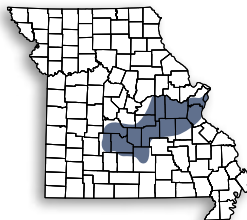
SPECIES ACCOUNTS

For more details, visit mdc.mo.gov/field-guide.

Eastern Hellbender

Cryptobranchus alleganiensis alleganiensis
(Daudin)

About: This robust, aquatic salamander lives mainly under large rocks and within bedrock crevices in rivers and large streams of the northern Ozark Highlands. Because of their nocturnal and secretive behavior, these salamanders are seldom observed by the casual visitor. At night, they move about on the river bottom searching for prey. Individuals have been known to live over 30 years. This endangered animal is impacted by degradation of its habitat from increased sediment from the surrounding landscape.



Description: This large salamander has a broad, flat head with very small eyes, and its body color varies from red-brown to gray-brown. Darker blotches may be present on the body, especially in smaller individuals. The sides of its body and limbs have large, soft folds of skin, and the tail is compressed side to side and rudderlike. The belly, which is uniform dark tan to gray-tan, is slightly lighter than the body and may be orange during the autumn breeding season.

Length: Ranges from 13 to 23 inches (330 to 584 mm) in total length.

Diet: Primarily crayfish and small fish, as well as a variety of aquatic insects, snails, and earthworms.

Missouri Distribution: Northern part of the Ozark Highlands in the central part of state.

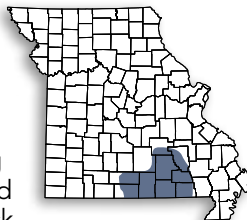


JEFFREY T. BRIGGLER

Ozark Hellbender

Cryptobranchus alleganiensis bishopi Grobman

About: This large, aquatic salamander inhabits rivers and large streams in the southern Ozark Highlands. It requires cool, clean, swift-flowing waters containing high levels of dissolved oxygen that is easily absorbed through the wrinkly skin along its sides. These salamanders are mostly nocturnal and make their homes under large rocks or within bedrock crevices. Like the eastern hellbender, this endangered species is sensitive to changes in its habitat and reduced water quality.



Description: The Ozark hellbender has a wide, flat head with tiny eyes and a compressed, rudderlike tail. The sides of the body and limbs are covered with prominent folds of skin. Body color varies from gray-brown to olive green with large dark blotches. The belly is dark tan to gray-brown.

Length: Ranges from 11 to 21 inches (279 to 533 mm) in total length.

Diet: Mainly crayfish, but also small fish, snails, and aquatic insects.

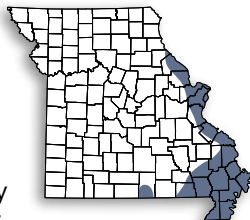
Missouri Distribution: Southern part of the Ozark Highlands in southern part of the state.



Western Lesser Siren

Siren intermedia nettingi Goin

About: The western lesser siren lives in sluggish streams, ditches, ponds, sloughs, shallow lakes, and swamps. Although they prefer to remain in water, they will occasionally venture onto land, especially during heavy rain events. If their aquatic home begins to dry, they will aestivate in the mud by secreting a thick mucus layer surrounding their body to prevent excessive water loss. Sirens are known to produce clicking and yelping sounds that may be a form of communication among individuals.



Description: A large, eel-like salamander with external gills, small eyes, and only one pair of front limbs. The uniform body color varies from dark gray to brown to almost black. Tiny black dots or flecks are usually scattered on the back and sides. Belly is uniform light gray.

Length: Ranges from 7 to 16 inches (178 to 406 mm) in total length.

Diet: Small crayfish, snails, aquatic insects, and earthworms.

Missouri Distribution: Eastern edge and southeastern part of the state.

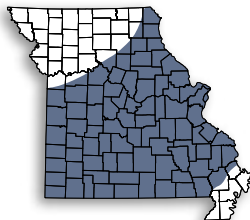


TOM R. JOHNSON

Central Newt

Notophthalmus viridescens louisianensis (Wolterstorff)

About: Adult central newts mainly inhabit ponds, water-filled ditches, sloughs, and swamps with plenty of aquatic vegetation. The newly hatched, aquatic larvae have gills and live in the water for several months. They then metamorphose from the water and begin to move onto land. These young, rough-skinned land-dwellers, known as efts, will live on land for several years prior to returning to a permanent aquatic habitat to spend most of their life. Central newts produce skin toxins, and their bright orange-brown to cream yellow color, especially in the eft stage, warn predators of their bad taste and toxicity.



Description: A small salamander with an olive-brown back and bright orange-yellow belly. Usually, the entire back and belly is covered with numerous small black spots. Distinct red spots are usually present along the back. A black line extends from the nostril through each eye.

Length: Ranges from 2.5 to 5 inches (64 to 127 mm) in total length.

Diet: Variety of aquatic invertebrates, as well as amphibian eggs and larvae.

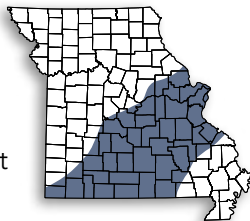
Missouri Distribution: Southern two-thirds of the state, except for southeastern corner.



Ringed Salamander

Ambystoma annulatum Cope

About: This colorful salamander inhabits the heavily forested areas of Missouri's Ozarks. Ringed salamanders are rarely seen due to their secretive life of remaining hidden underground in small mammal burrows or beneath logs and rocks for most of their life. However, this species will make overland movement during heavy rains in early autumn, sometimes by the hundreds, to a fishless pond to breed. This rare salamander is only found in forested highlands of Missouri, Arkansas, and Oklahoma.



Description: This slender and elongated salamander is named for its series of yellow to white colored rings extending over the grayish black to black body. The belly is usually a slate gray to buff yellow.

Length: Ranges from 5.5 to 7 inches (140 to 178 mm) in total length.

Diet: Variety of insects, snails, and earthworms.

Missouri Distribution: Ozark Highlands from southwestern to central part of the state.

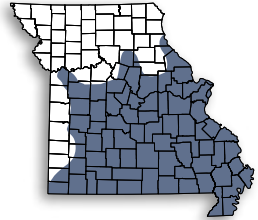


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Spotted Salamander

Ambystoma maculatum (Shaw)

About: This abundant salamander is rarely seen by the casual observer due to its habit of hiding most of its life. Spotted salamanders live most of their life in mature, hardwood forests, and they migrate to nearby shallow, fishless ponds to breed on rainy nights in late winter and early spring. Keeping spotted salamanders and many other *Ambystoma* species common in Missouri will require small, fishless ponds and pools needed for breeding within a forest dominated landscape.



Description: This robust salamander has a slate black body with numerous distinct yellow or orange spots from the head onto the tail. The spots on the head are usually orange compared to yellow for the rest of the body. The sides of the head, neck, and body usually have small white flecks, and the belly is uniform slate gray.

Length: Ranges from 4.5 to 7.5 inches (114 to 191 mm) in total length.

Diet: Mainly insects, spiders, earthworms, and land snails.

Missouri Distribution: Southern two-thirds of the state.

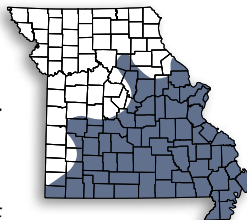


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Marbled Salamander

Ambystoma opacum (Gravenhorst)

About: This secretive forest salamander is most commonly encountered near breeding wetlands, such as fishless, woodland pools, ponds, or swamps. Most of their life is spent under rocks, logs, or forest debris, but during the autumn these animals depart from their terrestrial retreat to move to wetlands to breed. The females deposit eggs on the dry beds of pools or under logs, leaves, or leaf litter along the edge of the pond. The female then remains with her eggs until the eggs are covered with rising water level from rainfall.



Description: This small salamander has a chunky appearance. The body color is black with an overlay of white or light gray crossbands from head to tail. Crossbands are silvery white in males compared to more gray in females. The belly is a uniform black.

Length: Ranges from 3.5 to 4 inches (89 to 102 mm) in total length.

Diet: Variety of invertebrates, especially insects, slugs, and earthworms.

Missouri Distribution: Southeastern half of the state.

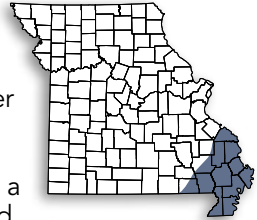


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Mole Salamander

Ambystoma talpoideum (Holbrook)

About: The mole salamander is primarily a bottomland, hardwood forest species and can be found under moist logs and leaf litter in the late winter and early spring. Breeding takes place in temporary pools, fishless ponds, and water-filled ditches during the winter months. Mole salamanders are considered a rare species in the state due to the loss of bottomland forest and associated breeding wetlands.



Description: A short, robust salamander with a large, broad head and large limbs. It is usually dull gray or brown with light gray to blue-gray flecks over most of the body, limbs, and tail. The belly is light gray.

Length: Ranges from 3 to 4 inches (76 to 102 mm) in total length.

Diet: Variety of small insects, worms, and snails.

Missouri Distribution: Southeastern corner of the state.

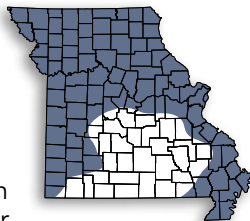


Small-mouthed Salamander

Ambystoma texanum (Matthes)

About: Like other *Ambystoma* salamanders, small-mouthed salamanders are rarely observed outside of the breeding season that occurs in late winter or early spring. They typically live under rocks, rotten logs, or in burrows made by other animals within bottomland and floodplain forest. However, they can be found in prairies using crayfish burrows for shelter.

They may exhibit a defensive body posture by lowering their head, curling the body, and raising and waving the tail when approached by a predator.



Description: It is appropriately named for the noticeably small head and mouth compared to many other *Ambystoma* species. Their background color varies from dark gray to black or dark brown. The body, limbs, and tail may be mottled with gray or grayish blue flecks. The belly is usually dark gray.

Length: Ranges from 4 to 5.5 inches (102 to 140 mm) in total length.

Diet: Variety of invertebrates such as insects, beetles, moths, centipedes, and worms.

Missouri Distribution: Throughout much of the state, except for most of the Ozark Highlands.



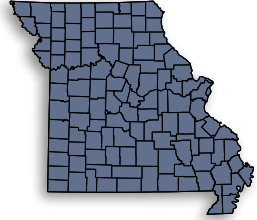
JEFFREY T. BRIGGLER

Eastern Tiger Salamander

Ambystoma tigrinum (Green)

About: This species makes its home in a variety of habitats, including woodlands, savannas, swamps, prairies, and old fields. They are most commonly found in grassland and prairie areas of Missouri.

During late autumn and into winter, individuals are often reported being trapped in wells, basements, and root cellars while migrating to breeding wetlands. This salamander is considered rare due to limited prairie and grassland habitats and fishless wetlands needed for breeding.



Description: A large, terrestrial salamander with yellow or olive blotches over the head, body, and tail. Background color is black to dark brown. The belly is dark gray with yellow to olive-yellow mottling along the sides.

Length: Ranges from 7 to 8.5 inches (178 to 216 mm) in total length.

Diet: Variety of invertebrates, young mice, and small frogs, salamanders, and snakes.

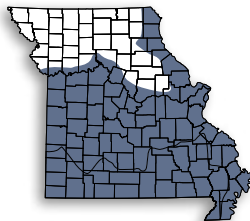
Missouri Distribution: Statewide.



Common Mudpuppy

Necturus maculosus maculosus (Rafinesque)

About: The mudpuppy is a fully aquatic salamander found in medium to large rivers and reservoirs. They live among rocks, sunken logs, and trees, or other submerged human-made materials from swift-flowing, gravel bottom streams to deep, muddy reservoirs. This harmless salamander is often captured by anglers on baited hooks or minnow traps. Individuals have been known to live over 30 years.



Description: This species is grayish brown with irregular dark brown to black spots on the body and tail. The squarish head has a dark line extending from the nostril to the large, red, feathery gills on each side. The tail is compressed and paddlelike. The belly is gray and usually has dark spots.

Length: Ranges from 8 to 13 inches (203 to 330 mm) in total length.

Diet: Crayfish, mollusks, small fish, earthworms, and variety of aquatic insects.

Missouri Distribution: Most of Missouri, except for northcentral and northwestern parts. A subspecies, Red River mudpuppy, *N. m. louisianensis* Viosca occurs in the extremely southern part of the state.

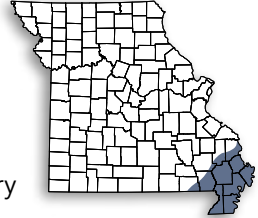


JEFFREY T. BRIGGLER

Three-toed Amphiuma

Amphiuma tridactylum Cuvier

About: An eel-like salamander that makes its home in ditches, sloughs, sluggish streams, and swamps, especially those wetlands with cypress and tupelo forests. Even though this salamander lives mostly an aquatic life, it can move on land between water bodies during heavy rains. If a wetland begins to dry, it will bury itself into soft mud or live in crayfish burrows to retain moisture until rains return. Much of its preferred habitat, cypress swamps, has been eliminated.



Description: A large, aquatic salamander shaped like a long cylinder with a somewhat pointed head. It has tiny eyes and very small fore and hind limbs. Each limb has three small toes. The body color is dark brown to black and the belly is a lighter brown or gray.

Length: Ranges from 18 to 30 inches (457 to 762 mm) in total length.

Diet: Variety of aquatic invertebrates (e.g., crayfish, earthworms, and snails), as well as small fish and tadpoles.

Missouri Distribution: Southeastern part of the state.

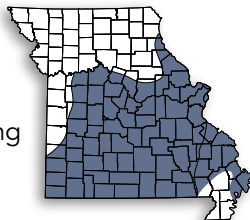


TOM R. JOHNSON

Eastern Long-tailed Salamander

Eurycea longicauda longicauda (Green)

About: This mostly terrestrial species is often found in caves, along margins of small, intermittent streams, and seepage areas throughout the forests. It will not hesitate to squirm into water or make quick jumps using their long tail to escape predators. Eggs are laid in a small cluster or singly in springs, rocky streams, and cave pools during the winter and the hatchling, gilled larvae remain in the aquatic habitat for about a year prior to transformation. This is a widespread and common salamander of the Ozarks.



Description: A medium-sized, slender salamander that has a long tail. It is usually yellow to orange-yellow with dark brown or black markings and spots along the back and sides. The tail has prominent vertical bars. The dark-sided salamander subspecies looks quite different from the long-tailed salamander. It has a large amount of dark pigment along the side of the body from head to tail, and the sides are often spotted with white flecks. The belly in both subspecies is yellow.

Length: Ranges from 3.5 to 6.5 inches (89 to 165 mm) in total length.

Diet: Variety of small terrestrial and aquatic invertebrates, especially arthropods.

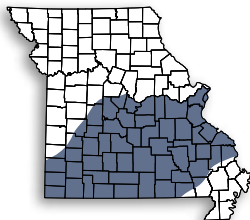
Missouri Distribution: Occurs in the eastern part of the state and intergrades with the subspecies, dark-sided salamander, *E. l. melanopleura* (Cope) that occurs in the western part of state.



Cave Salamander

Eurycea lucifuga Rafinesque

About: The cave salamander is appropriately named for its affinity to inhabit caves throughout the forested Ozarks. Occasionally, this species can be found along rocky, intermittent streams and seepages. This species lay their eggs mostly in cave streams and pools during the autumn and winter months. The gilled hatchlings will transform from their aquatic habitat within one and a half years. This species can be quite common due to the many caves found throughout the Ozarks.



Description: This colorful, medium-sized salamander has a wide head, large eyes, and a long tail. It is normally bright orange but can vary from yellow to orange-red. Distinct dark spots cover most of the body, and the tip of tail is often black. The belly is usually a uniform cream color.

Length: Ranges from 4 to 6 inches (102 to 152 mm) in total length.

Diet: Variety of small arthropods, especially isopods and amphipods.

Missouri Distribution: Most of the southern half of the state, excluding the southeastern corner.

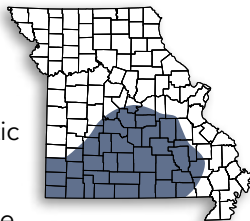


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Grotto Salamander

Eurycea spelaea Stejneger

About: This rare, mostly blind salamander is restricted to the cave and karst habitats in upland forests of the Ozarks. Knowledge of basic reproductive biology is lacking, but the gilled, aquatic larvae have functional eyes that are lost as they become adults. Individuals have been known to live up to 10 years, but a longer life span may be possible due to its low metabolic need and few predators in cave systems. Protecting caves from human disturbance and water pollution will keep this interesting salamander in Missouri.



Description: They have a wide and flat head, small eyes, and a long, slender tail. Adult grotto salamanders have a tan white to pink-white body and belly color, and they are partly or completely blind.

Length: Ranges from 3 to 5 inches (76 to 127 mm) in total length.

Diet: Variety of small aquatic and terrestrial invertebrates and small salamander larvae.

Missouri Distribution: Most of the Ozark Highlands parts of the state.

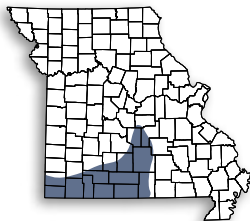


JIM RATHERT

Oklahoma Salamander

Eurycea tynerensis Moore and Hughes

About: The Oklahoma salamander is a small, dark salamander that mostly lives a permanently aquatic life in cherty, gravel-bottom creeks, streams, and springs. During drying summer conditions, this gilled salamander will usually follow the water level down into the gravel substrates; however, it may transform to live under rocks along the stream margins. The entire range of this species occurs in a small geographical area in southwestern Missouri, northwestern Arkansas, and northeastern Oklahoma.



Description: This yellowish tan to dark brown or gray species normally has some chevron markings along the back and a yellow stripe along the upper part of the tail. Small white flecks are present along the sides and tail. Adults normally retain their gills to live in water, but they may transform for a mostly terrestrial life. Belly is gray to cream.

Length: Ranges from 2 to 3.5 inches (51 to 89 mm) in total length.

Diet: Variety of small arthropods, such as water fleas, flies, pill bugs, etc.

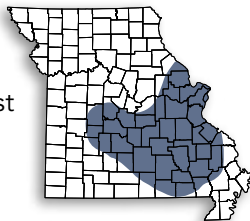
Missouri Distribution: Central and southwestern parts of the state.



Four-toed Salamander

Hemidactylium scutatum
(Temminck and Schlegel in Von Siebold)

About: This terrestrial salamander is named for having four toes on each hind foot compared to most salamanders having five toes. This species prefers mossy areas along heavily forested, headwater streams, spring-fed creeks, margins of fens, or shallow, fishless pools. Several females may deposit eggs within the same mossy area, usually overhanging water, in early spring. Females remain with the eggs until they hatch. The small larvae wiggle into the water below to live an aquatic life for up to six weeks. This northern species is considered a glacial relict with scattered populations in its southern range.



Description: This small salamander has a short, blunt snout, four toes on both fore and hind limbs, and a thick, round tail. Body color is yellowish tan to rusty brown with many faint, irregular dark spots and grayish stippling along its sides. The belly is white with numerous large, irregular black spots.

Length: Ranges from 2 to 3.5 inches (51 to 89 mm) in total length.

Diet: Variety of terrestrial arthropods and snails.

Missouri Distribution: Mainly eastern half of the Missouri Ozarks.



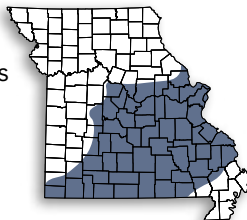
JEFFREY T. BRIGGLER

Western Slimy Salamander

Plethodon albagula Grobman

About: This terrestrial salamander is appropriately named for the thick, sticky mucus secreted by glands in the tail that make it slimy and sticky to the touch. Western slimy salamanders make their home under rocks and logs in damp ravines and moist wooded hillsides. This species deposits eggs in moist areas, especially within wall crevices within Ozark caves.

The female remains with her eggs for several months until they hatch into tiny replicates of the adults. They can be quite abundant along moist, forested hillsides.



Description: This medium-sized species is black to blue-black with a long, rounded tail. The body is covered with numerous silvery flecks from head to tail. The chin and belly are dark gray.

Length: Ranges from 5 to 7 inches (127 to 178 mm) in total length.

Diet: Variety of small arthropods, especially ants and beetles, as well as earthworms.

Missouri Distribution: Ozark Highlands and river hills north of Missouri River.

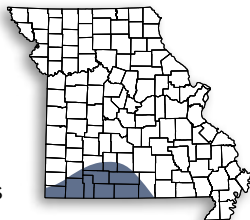


Ozark Zigzag Salamander

Plethodon angusticlavius Grobman

About: A small, slender salamander that makes its home in or under rotten logs, rocks, and moist leaf litter in upland forested areas in the southwestern Ozarks. This species deposits eggs mainly in underground cavities and crevices. Like other plethodontid salamanders, the female remains with her eggs until they hatch in the late summer.

The young go through complete development in the egg and hatch into tiny replicas of the adult. This species is known to communicate among themselves and establish territorial boundaries by releasing chemical odors.



Description: The Ozark zigzag salamander has a dark brown to black pigmented background color with a conspicuous red, orange, or yellow stripe along body and most of the tail. The stripe is widest near the hind limbs. The sides of the body have some small orange or white flecks. The belly is white with black mottling.

Length: Ranges from 2.5 to 4 inches (64 to 102 mm) in total length.

Diet: Variety of terrestrial invertebrates, such as flies, mites, and ants.

Missouri Distribution: Southwestern part of the state.



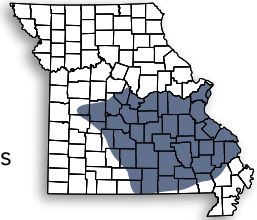
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Southern Red-backed Salamander

Plethodon serratus Grobman

About: This small, terrestrial salamander is one of the most common and abundant species within the forested landscape of the south-central Ozarks. It seeks shelter under rocks, damp leaves, clumps of moss, and rotten logs. Females remain with the eggs throughout their development, and upon hatching the young are similar in appearance to the adults.

Keeping this species and many other ground-dwelling salamanders common in Missouri will require intact hardwood forests.



Description: This species is similar in appearance to the Ozark zigzag salamander. It has a dark, slender body with a distinct, narrow, red or orange stripe along the body and tail. However, the stripe has saw-toothed edges and a uniform width compared to the stripe pattern in the Ozark zigzag salamander. The belly is covered with gray mottling.

Length: Ranges from 3 to 4 inches (76 to 102 mm) in total length.

Diet: Variety of terrestrial invertebrates, such as ants, beetles, termites, and earthworms.

Missouri Distribution: Northern and southeastern Ozarks parts of the state.



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MISSOURI'S SALAMANDERS AND THEIR CONSERVATION

Salamanders are rarely seen by most Missourian's due to their secretive habits of hiding under rocks, logs, or leaf litter, or in small burrows during the daytime and being active at night, especially rainy ones. Missouri's salamanders live in a variety of habitats, from permanently aquatic species that live in rivers and streams to many other species that live under rocks and logs or in burrows or caves primarily within forested habitats and migrate to wetlands (e.g., permanent ponds, temporary wetlands, and intermittent streams) to breed.



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Many salamander species live under logs, rocks, and moist leaf litter along forested slopes.



Several salamander species use fishless, woodland ponds for breeding.

Like many other amphibians, salamanders are not immune to threats that can affect their population levels. Salamanders are vulnerable to a variety of threats, such as loss of both terrestrial and breeding wetland habitats, diseases, climate change, invasive animal species, pollutants, collection for the pet trade, and roads.

Landowners who are interested in helping salamanders can do so by following some simple land management practices. A good number of species native to Missouri breed in fishless ponds or temporary pools. Constructing shallow wetlands or keeping an existing pond fishless is vital for these species to reproduce. Small brush piles placed in the water near the pond edge, as well as near the pond, provide good hiding places for young salamanders as they leave the

***With a little effort,
landowners can ensure
that many of Missouri's
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common.***

pond. Placing dead tree branches in shallow water will provide places for female salamanders to attach their egg masses. Fencing the pond from cattle will protect the water quality and allow the growth of more diverse plants, which will provide cover and insects for salamanders to eat. Pesticides should be kept away from any salamander pond because salamander eggs and larvae are highly sensitive to these chemicals. Keeping forested buffer areas along intermittent streams will also benefit a wide variety of salamanders that live along the forested slopes and breed in the shallow, stream pools. With a little effort, landowners can ensure that many of Missouri's salamanders remain common.



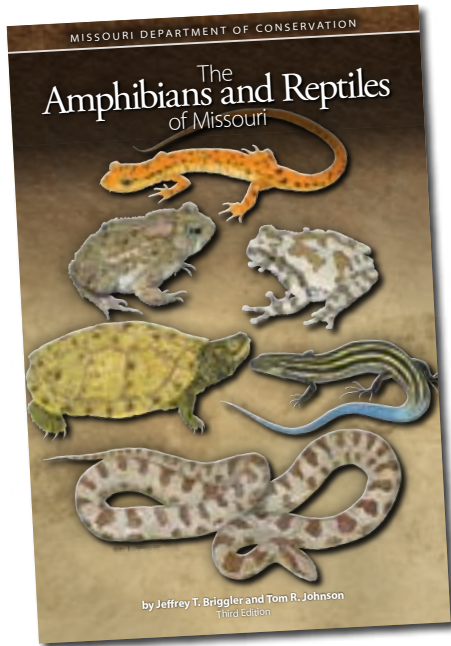
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Several salamander species live and breed in and along the margins of shallow streams.



Many salamander species depend on caves for some or all of their life cycle.

Although salamanders are small and rarely seen, they can occur in large numbers and therefore, represent an important link in the food chain. They play a crucial role in the transfer of energy by eating many small invertebrates in both aquatic and terrestrial habitats and being preyed upon by larger carnivores. They assist with controlling many insect pests that affect plants and humans. Salamanders are a fascinating part of the natural world in which we live. Seeing hundreds of breeding salamanders in a small, fishless pond on a rainy night is not only enjoyable, but a rewarding experience for rarely observed animals.



To help you learn more about Missouri's frogs and toads, consider purchasing *The Amphibians and Reptiles of Missouri* (2021) third edition by State Herpetologist Jeffrey T. Briggler and retired State Herpetologist Tom R. Johnson. This updated and expanded 522-page book is a valuable resource for understanding and identifying some of Missouri's most interesting species. To purchase, go online to mdcnatureshop.com or call 573-522-0108.



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